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Good evening Troy, Sumalee, and Kim,

On November 13, 2015 the following reports were submitted to your office for review:

1. Habitat Assessments for Roanoke Logperch (Percina rex) along the Proposed Mountain Valley Pipeline in Virginia
2. Freshwater Mussel (Unionidae) Site Assessments and Surveys for the Proposed Mountain Valley Pipeline in Virginia
3. Surveys for Rare Plants along MVP's Proposed Mountain Valley Pipeline Project in Craig, Franklin, Giles, Montgomery, Pittsylvania, and Roanoke Counties, Virginia
4. Listed Bat Studies along MVP's Proposed Mountain Valley Pipeline Project in Craig, Franklin, Giles, Montgomery, Pittsylvania, and Roanoke counties, Virginia

Accompanying these reports was written notification of MVP's intent to initiate Formal Consultation under Section (7)(a)(2) of the Endangered Species Act to the U.S. Fish and Wildlife Service. As it has been approximately 60 days since the submission of these documents, MVP and ESI respectfully request your review and any comments/questions regarding their content.

Also, attached you will find a copy of the proposed modeling methods used in MVP's draft Biological Assessment to estimate take of federally listed aquatic species. MVP and ESI respectfully request your review of these methods.

Please contact us with any questions.

Thanks,

Valerie

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Take Model Description for Aquatic Species

The Biological Assessment will utilize a formal Take Model to quantify impacts of MVP construction to the federally endangered Roanoke logperch (*Percina rex*) and three endangered mussel species: James spinymussel (*Pleurobema collina*), clubshell (*Pleurobema clava*), and snuffbox (*Epioblasma triquetra*). Impacts to mussels are not likely, given the proximity of their known occurrences to the limits of disturbance (LOD) and the Action Area. Any direct effects to these mussel species will be due to increased sedimentation in the Action Area downstream of the LOD. As with the mussel species, the potential affects to the Roanoke logperch will include sedimentation; however, for the fish, direct effects will also be considered as a result of construction activities within the LOD as well.

The Take Model will evaluate potential effects from "harm" and/or "harassment" to the Roanoke logperch within the LOD and Action Area in each of the three stream crossings where the species is assumed present. Effects of these activities will be limited to the designated 75 foot Project corridor footprint (LOD) at the stream crossings, where, immediately prior to construction, fish will be removed using standard electrofishing protocols for wadeable warm-water streams (Bonar et al. 2009). Such removals include a low, but possible, chance of mortality or injury (i.e., harm), and the actual translocation of individuals to new areas is a form of harassment.

To quantify direct impact in the LOD, fish density estimates developed by Roberts (2012) will be used to determine the number of adult and subadult logperch (i.e., Age-1+) present in the Action Area, downstream of each stream crossings where the species is assumed present. Since these estimates do not include young-of-the-year (YOY) logperch, estimates of YOY for any given year will be derived using the aforementioned Age-1+ estimate and the maximum population growth rate estimate from Roberts et al. (2015). Harm for each age class is then calculated as the product of the number of individuals expected within the LOD and an 8 percent harm rate (Cooke et al. 1998). The remainder of individuals within the LOD will be used as the estimate of the number harassed.

In addition, downstream effects on individuals of Roanoke logperch, James spinymussel, clubshell, and snuffbox throughout the Action Area are possible due to increased sediment. Thus, estimating the likelihood and occurrence of increased sediment within the Action Area (e.g., upland land disturbances, downstream of instream LODs) is an essential component of the effects analysis. This analysis assumes standard erosion and sedimentation control methods but depending on the outcome of this analysis, the methods may be modified to include additional avoidance and minimization measures to reduce the amount of sedimentation in the stream. To identify the extent of Action Area attributed to sedimentation effects, a hydrologic analysis of sedimentation will be performed using the Revised Universal Soil Loss Equation (RUSLE; Renard et al. 1997). Results from RUSLE yields generalized annual estimates of erosion rates and sediment yields based on climate,

topography, and land use/management factors. These estimates can be used to identify streams that are likely to have higher post construction sediment loads as compared to baseline, pre-construction levels. A national standard for the permissible amount of sediment to enter waterways is not available or established. Although the metrics used to assess impacts vary widely among states, tribes, and organizations, a common threshold identified is one that increases sedimentation metrics by 10 percent or more above baseline. Given that the mechanisms behind impacts of sediment can be due to either deposition or suspension (or both), total sediment load provides a reasonable metric, because it address both suspended and deposited sediments within a stream channel. The Action Area attributed to sedimentation effects will be defined as any stream reach that increases existing total sediment load by more than 10 percent. Any individual occupying this component of the Action Area will be included in the number of harassed individuals.

In addition to effects on individuals, direct temporary effects to habitat are inevitable. For the three mussel species, direct effects to habitat will occur within the Action Area that intersect stream reaches of waterbodies (i.e., Leading Creek, Little Kanawha River, and Craig Creek) potentially supporting federally endangered mussels. For the Roanoke logperch, direct effects to habitat will occur in the Action Area of waterbodies (i.e., North Fork Roanoke River, Roanoke River, and Pigg River) where the presence of Roanoke logperch is assumed.